Amendments to the Specification:

The amendments given below have been numbered for ease of reference to them in the Remarks section of this Reply. The numbers begin at 24 (RCE), so that they run consecutively with the amendments numbered 1-23 in the Reply to the first Office Action. As noted above, the amendments in paragraphs 24-31 in the Reply to the final Office Action have NOT been entered.

24 (RCE). Please cancel the amendment requested in paragraph 8 of the Reply mailed August 18, 2003 [replacement of the paragraph beginning on page 2, line 8, with the words "It has now been..." by an amended paragraph].

25 (RCE). Please replace the paragraph beginning on page 2, line 8, with the words "It has now been..." and ending on page 2, line 14, with the words "... performance characteristics." by the following amended paragraph.

It has now been discovered, according to the present invention, that improved insulation can be provided by a first layer comprising a selected carbonyl-containing polymer and an adjacent second layer comprising a selected fluoropolymer. These layers ~~the dissimilar insulation materials of a polyolefin-based core and a polyvinylidene fluoride-based PJ~~ can be bonded together by cross-linking to provide insulation having an improved ~~to a significant level of adhesion on an electrical wire or cable; that this bonding tends to reduce or eliminate the aforementioned robustness problems on a wire; and that this bonding can be achieved, contrary to expectation, without unacceptable effects on crack propagation resistance, cost, or on the general~~ balance of wire-performance characteristics.

27 (RCE). Please cancel the amendment requested in paragraph 10 of the Reply mailed August 18, 2003 [replacement of the paragraph beginning on page 2, line 21 (page 2, line 22, of the published PCT specification), with the words "The invention accordingly..." by an amended paragraph].

28 (RCE). Please replace the paragraph beginning on page 2, line 21 (page 2, line 22, of the published PCT specification), with the words "The invention accordingly..." and ending on page 3, line 8 (page 3, line 9, of the published PCT specification), with the words "... the uncrosslinked layers.", with the following amended paragraphs.

In a first aspect, this ~~The~~ invention ~~accordingly~~ provides an insulated electrical wire comprising

1) a metallic conductor, and

2) ~~having~~ insulation comprising

(i) ~~at least~~ a first layer which is composed of a ~~polyolefin-based material comprising, of which~~ first polymeric composition consisting of a first polymeric component and optionally a first additive component, the first polymeric component comprising at least ~~20%, preferably at least 40%, more preferably at least~~ 60% ~~or~~ preferably at least 80%, by weight, based on the weight of the first polymeric component, (or, in some embodiments, based on the weight of the whole ~~material~~ composition) of a carbonyl-containing polymer (which may be a homopolymer or copolymer ~~or~~ , including ~~terpolymer) having~~ terpolymer, and which may have a non-aromatic backbone), ~~of which polymer the or at least one constituent monomer is~~ the carbonyl-containing polymer comprising repeating units derived from a monomer which (a) can be copolymerized with an olefinic monomer and (b) contains a carboxylic acid ester group, preferably an acrylate or acetate, especially an alkyl acrylate (preferably methyl acrylate, ethyl acrylate, propyl acrylate or butyl acrylate), the units derived from said monomer ~~itself~~ constituting at least 5%, preferably at least 9%, more preferably at least 15%, for example 15 to 28%, by weight of the carbonyl-containing polymer ~~said co-, or ter- polymer when used~~, and ~~the remainder~~ any other repeating units of the carbonyl-containing polymer ~~said co-, or ter- polymer~~ preferably being derived from an olefinic monomer, preferably ethylene;

~~in contact with;~~

(ii) ~~at least~~ a second layer which is in direct contact with the first layer at an interface, and which is composed of a second polymeric composition consisting of a second polymeric component and optionally a second additive component, the second polymeric component comprising ~~of a material containing at least 10%, more preferably~~ at least 50%, particularly ~~or~~ at least 90%, for example substantially 100%, by weight based on the ~~whole material~~ weight of the second polymeric composition, of polyvinylidene fluoride (PVDF) ~~, or especially preferably a copolymer based on VDF with a partially or fully fluorinated co-monomer, most preferably a copolymer of VDF and~~ or a vinylidene fluoride (VDF) copolymer consisting essentially of

(a) repeating units derived from vinylidene chloride, and

(b) repeating units derived from a partially or fully fluorinated co-monomer, preferably hexafluoropropylene (HFP);

the first layer being positioned between the conductor and the second layer.

In a second aspect, this invention provides an insulated electrical wire comprising

1) a metallic conductor, and

2) insulation which comprises

(i) a first layer which is composed of a first polymeric composition comprising at least 60%, preferably at least 80%, by weight, based on the weight of the first polymeric composition, of a carbonyl-containing polymer (which may be a homopolymer or copolymer, including terpolymer, and which may have a non-aromatic backbone), the carbonyl-containing polymer comprising repeating units derived from a monomer which (a) can be copolymerized with an olefinic monomer and (b) contains a carboxylic acid ester group, preferably an acrylate or acetate, especially an alkyl acrylate (preferably methyl acrylate, ethyl acrylate, propyl acrylate or butyl acrylate), the units derived from said monomer constituting at least 5%, preferably at least 9%, more preferably at least 15% , for example 15 to 28%, by weight of the carbonyl-containing polymer, and any other repeating units of the carbonyl-containing polymer preferably being derived from an olefinic monomer, preferably ethylene, and

(ii) a second layer which is in direct contact with the first layer at an interface, and which is composed of a second polymeric composition comprising at least 50%, preferably at least 90%, for example substantially 100%, by weight, based on the weight of the second polymeric composition, of polyvinylidene fluoride (PVDF) or a vinylidene fluoride (VDF) copolymer consisting essentially of

(a) repeating units derived from vinylidene fluoride, and

(b) repeating units derived from a partially or fully fluorinated comonomer, preferably hexafluoropropylene (HFP);

the first layer being positioned between the conductor and the second layer.

In a third aspect, this invention provides an insulated electrical wire comprising

1) a metallic conductor, and

2) insulation which comprises

(i) a first layer which is composed of a first polymeric composition consisting of a first polymeric component and optionally at least one additive selected from cross-linking promoters, antioxidants, pigments, fillers, flame retardants, stabilizers and process aids, the first polymeric component comprising at least 60%, preferably at least 80%, by weight, based on the weight of the first polymeric component, of a carbonyl-containing polymer (which may be a homopolymer or copolymer, including terpolymer, and which

may have a non-aromatic backbone), the carbonyl-containing polymer comprising repeating units derived from a monomer which (a) can be copolymerized with an olefinic monomer and (b) contains a carboxylic acid ester group, preferably an acrylate or acetate, especially an alkyl acrylate (preferably methyl acrylate, ethyl acrylate, propyl acrylate or butyl acrylate), the units derived from said monomer constituting at least 5%, preferably at least 9%, more preferably at least 15% , for example 15 to 28%, by weight of the carbonyl-containing polymer, and any other repeating units of the carbonyl-containing polymer preferably being derived from an olefinic monomer, preferably ethylene, and

(ii) a second layer which is in direct contact with the first layer at an interface, and which is composed of a second polymeric composition consisting of a second polymeric component and optionally at least one additive selected from cross-linking promoters, antioxidants, pigments, fillers, flame retardants, stabilizers, process aids and plasticizers, the second polymeric component comprising at least 50%, preferably at least 90%, for example substantially 100%, by weight, based on the weight of the second polymeric composition, of polyvinylidene fluoride (PVDF) or a vinylidene fluoride (VDF) copolymer consisting essentially of

(a) repeating units derived from vinylidene fluoride, and

(b) repeating units derived from a partially or fully fluorinated comonomer, preferably hexafluoropropylene (HFP);

the first layer being positioned between the conductor and the second layer.

Preferably, in each of the first, second and third aspects of the invention, the ~~wherein the said~~ layers (i) and (ii), while ~~whilst~~ in contact with each other, have been subjected to conditions which cause cross-linking of polymers at the interface between them ~~reaction~~, preferably by subjecting the layers to radiation, particularly ~~more preferably~~ ionising radiation. The ~~sufficient to prevent delamination of the two layers during the acetone emotion test described below, or to increase~~ cross-linking is preferably such that at least one of the following conditions is fulfilled

(a) the peel bond strength between the ~~said~~ layers, measured by ASTM 81876- 95, is ~~to~~ at least 5N, preferably more than 10N ~~according to the ASTM 1876-95 method described below preferably increasing the,~~

(b) when a sample of the insulated electrical wire 60 mm long is immersed to a depth of 42 mm in a bath of acetone at 23 °C for 1 hour, there is no delamination of the two layers, and

(c) the peel bond strength between the layers after the crosslinking, measured by ASTM B1876-95, is at least 50%, ~~more~~ preferably ~~by~~ at least 100%, especially ~~by~~ at least 500% or 1000%, ~~compared to that between the uncross linked layers~~ greater than the peel bond strength between the layers before the crosslinking, measured by ASTM B1876-95.

29 (RCE). Please cancel the amendment requested in paragraph 11 of the Reply mailed August 18, 2003 (addition of a new paragraph after the amended paragraphs set out in 28 RCE above).

30 (RCE). Please cancel the amendment requested in paragraph 12 of the Reply mailed August 18, 2003 [replacement of the paragraph beginning on page 3, line 12 (page 3, line 11 of the published PCT specification) with the words "According to another aspect of the invention..." by a new paragraph].

31 (RCE) Please replace the paragraph beginning on page 3, line 12 (page 3, line 11 of the published PCT specification) with the words "According to another aspect of the invention..." and ending on page 4, line 4, with the words "... the uncrosslinked layers." with the following amended paragraph.

A fourth ~~According to another~~ aspect of the invention provides a method of making an insulated wire or cable, the method comprising the steps of

(A) providing an electrical conductor surrounded by

(i) a first layer which is composed of a first polymeric composition as defined in the first, second or third aspect of the invention; and

(ii) a second layer which is composed of a second polymeric composition as defined in the first, second or third aspect of the invention;

the first and second layers being in direct contact with each other at an interface, and the first layer being positioned between the conductor and the second layer; and

(B) exposing the layers while in contact with each other to ionising radiation which causes cross-linking of polymers at the interface.

~~we provide an electrical wire having insulation comprising:~~

~~(i) at least a first layer of a polyolefin-based formulation, of which at least 20%, preferably at least 40%, more preferably at least 60% or very preferably at least 80% of the weight of the polymeric portion of the said formulation consists of a carbonyl-containing polymer (homopolymer or copolymer or terpolymer), of which polymer the or at least one constituent monomer is a carboxylic acid ester, preferably an acrylate or acetate, especially an alkyl acrylate (preferably methyl acrylate, ethyl acrylate, propyl acrylate or butyl acrylate), the said~~

~~monomer itself constituting at least 5%, preferably at least 9%, more preferably at least 15% by weight of the said co-, or ter- polymer when used, and the remainder or the majority of the remainder of the said co-, or ter- polymer preferably being derived from olefinic monomer, preferably ethylene; in contact with~~

~~(ii) at least a second layer of another material formulation, containing at least 10%, more preferably at least 50%, very preferably at least 90%, especially 100%, by weight of the second layer, of polyvinylidine fluoride (PVDF), or especially preferably of a copolymer based on VDF with a partially or fully fluorinated co-monomer, most preferably a copolymer of VDF and hexafluoropropylene (HFP);~~

~~wherein the said layers (i) and (ii) whilst in contact with each other have been subjected to cross-linking reaction, preferably by radiation, more preferably ionising radiation, sufficient to prevent delamination of the two layers during the acetone immersion test described below, or to increase the peel bond strength between the said layers to at least 5N according to the ASTM B1876-95 method described below preferably increasing the bond strength by at least 50%, more preferably by at least 100%, especially by at least 500% or 1000%, compared to that between the uncrosslinked layers.~~

32 (RCE). Please cancel the amendment requested in paragraph 14 of the Reply mailed August 18, 2003 [addition of a new paragraph after the new heading DETAILED DESCRIPTION OF THE INVENTION added by the amendment requested in paragraph 13 of the Reply mailed August 18, 2003].

33 (RCE). Please insert the following new paragraph after the heading DETAILED DESCRIPTION OF THE INVENTION added by the amendment requested in paragraph 13 of the Reply mailed August 18, 2003.

In some embodiments of the invention, the first polymeric component contains, in addition to the carbonyl-containing polymer, polyethylene, preferably high density polyethylene.

34 (RCE). Please cancel the amendment requested in paragraph 16 of the Reply mailed August 18, 2003 [replacement of the paragraph beginning on page 4, line 10 (page 4, line 12, of published PCT specification) with an amended paragraph].

35 (RCE). Please replace the paragraph beginning on page 4, line 10 (page 4, line 12, of the published PCT specification) with the words "The polyolefin-based layer ..." and ending on page 4, line 13 (page 4, line 15 of published PCT specification), with the words "...properties to the polymer.", with the following amended paragraph.

Each of the layers (i) and (ii) optionally contains, in ~~The polyolefin-based layer (i) in~~ addition to the polymeric component, an additive component which contains ~~portion of the formulation, for which the requirements are stipulated above, may contain~~ whatever else is required in the way of additives such as anti-oxidants, pigments, fillers, flame retardants, stabilizers, process aids, plasticizers etc, as known per se to enhance the ~~to give the required~~ mechanical, thermal, electrical etc. properties of the insulation ~~to the polymer~~.

36 (RCE). Please cancel the amendment requested in paragraph 19 of the previous Reply. [Replacement of the paragraph beginning on page 4, line 30 (page 5, line 1, of the published PCT specification) with the words "The bond strength described..." by an amended paragraph].

37 (RCE). Please replace the paragraph beginning on page 4, line 30 (page 5, line 1, of the published PCT specification) with the words "The bond strength described..." and ending on page 5, line 15 (page 5, line 19, of published PCT specification), with the words "... under a microscope." with the following amended paragraph.

~~The bond strength described in this application can be measured in terms of peel strength between bonded strips of the two materials in question. A standard method which can be used for such a test is ASTM 1876-95. By this definition, a significant bond could be one for which the peel force exceeds 5N, and a strong bond one of peel force greater than 10N.~~ A convenient method for gauging the bond strength between the layers ~~said layers,~~ (i) and (ii), when they have been fabricated onto a wire, is to immerse ~~place~~ a sample wire, of total length 60mm, ~~into~~ in a bath of acetone (e.g. Fisher Scientific UK, AR certified grade acetone), to a depth of 42 mm ~~acetone equivalent to 70% of the length of sample wire,~~ at 23 (+/- 3) °C, for a period of 1 hour. Wires with negligible bonding of the insulation layers experience an extension of the outer layer ~~PVDF PJ~~, along the axis of the wire, that is independent of any extension of the inner layer ~~polyolefin core~~, and/or wrinkling of the outer layer ~~PJ~~ such that it delaminates from the inner layer ~~core~~ in places. When it occurs, the above-mentioned extension of the outer layer ~~PJ~~ typically results in a ~~PJ~~ "tube" extending for 1mm or more beyond the cut end of the inner layer ~~core in the sample wire, following the above test~~. Wires with significantly bonded insulation layers experience an extension of both layers ~~the core and PJ, together~~, without separation, beyond the cut edge of the conductor,

along the axis of the wire and/or wrinkling of the two ~~core and PJ~~ layers together, without delamination. Any such wrinkling of the two layers ~~core and PJ~~ together can be distinguished from wrinkling only of the outer layer ~~PJ only~~ by examining a cross-section of the wrinkles under a microscope.

38 (RCE). Please cancel the amendment requested in paragraph 20 of the previous Reply [replacement of the paragraph beginning on page 5, line 17 (page 5, line 21, of the published PCT specification) with the words "Methods of fabricating the wire..." with an amended paragraph].

39 (RCE). Please replace the paragraph beginning on page 5, line 17 (page 5, line 21, of the published PCT specification) with the words "Methods of fabricating the wire..." and ending on page 5, line 27 (page 5, line 31 of the published PCT specification) with the following amended paragraph.

In the method of the invention, step (A) can make use of any ~~Methods of fabricating the wire may include any~~ process which causes intimate contact between the ~~above-mentioned~~ layers (i) and (ii). Examples include coating the second polymeric composition ~~of one material~~ onto a pre-formed layer of the first polymeric composition ~~other~~, and dual or multi-walled extrusion to form insulation layers respectively containing one or other of the polymeric compositions. ~~aforementioned two classes of material. The olefin-based material (i) is preferably the inner layer and the PVDF-based layer is preferably the outer layer on the wire.~~ The layers made from the two different compositions can ~~materials could~~ be coextruded, tandem extruded, multipass extruded, or coated by other means. Known wire insulation processes such as tube draw-down extrusion may be used, to form one or more of the layers, but pressure extrusion as known per se is preferred for optimum adhesion of the second and any subsequent insulation layers to be applied to a pre-formed underlying layer. The first layer can optionally be in direct contact with the conductor. The insulation can consist of a first layer as defined and a second layer as defined. The insulation can be multilayer insulation, for example multiple alternating layers of the first and second polymeric compositions.